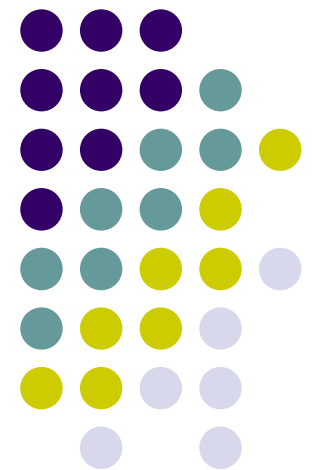# Enhanced Gaming and Pointing

6.111 Final Project
David Dryjanski
Andrew Pinkham
April 22, 2005

Overview

- Main Idea: Convert Video gaming into a more virtual experience, and allow the disabled to more easily use their computer

- Project will replace the existing joystick functionality of the Xbox controller with a physical body sensing interface.

- 5 degrees of control: 3 for head movement and 2 for body movement.

- The composite xbox video will be partitioned into 4 different VGA outputs to be displayed on separate screens, allowing for a better multiplayer experience.
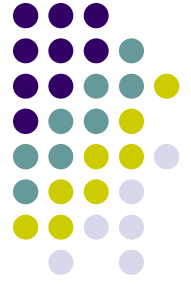
Overall Block Diagram
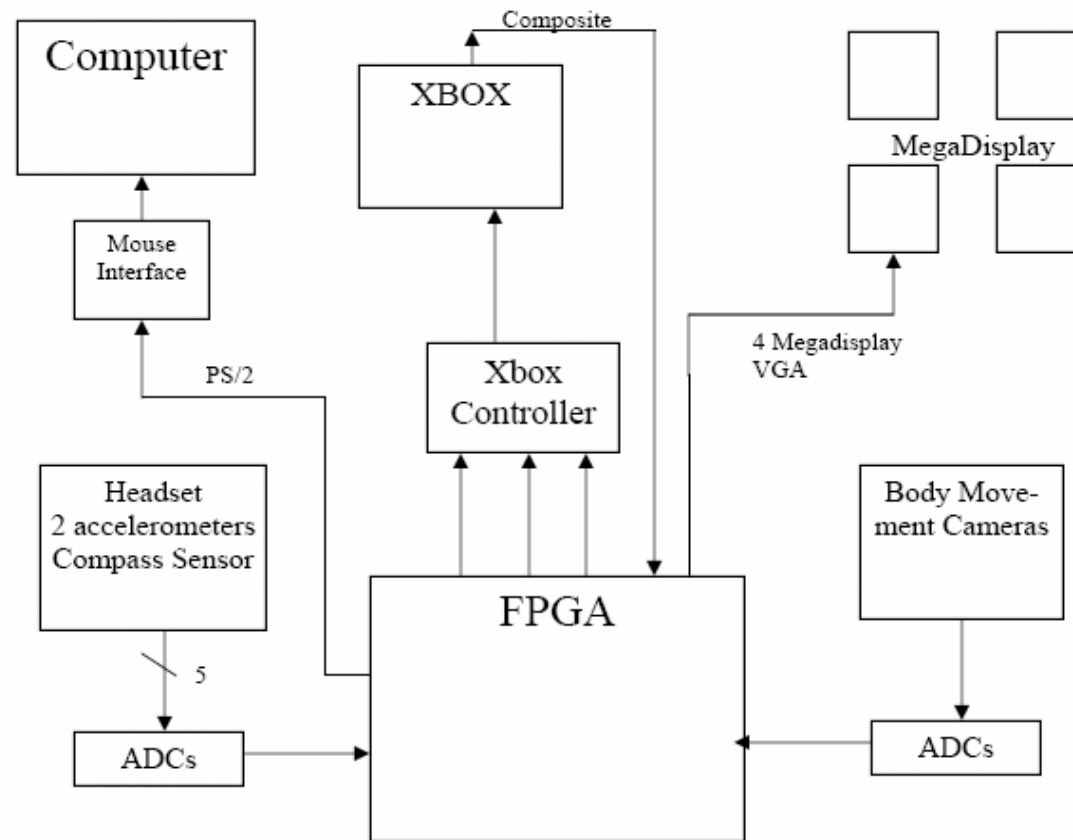
Division of Labor

- Headset Interface – Andrew
- Video Interface – David
- VGA Splitter – Andrew and David
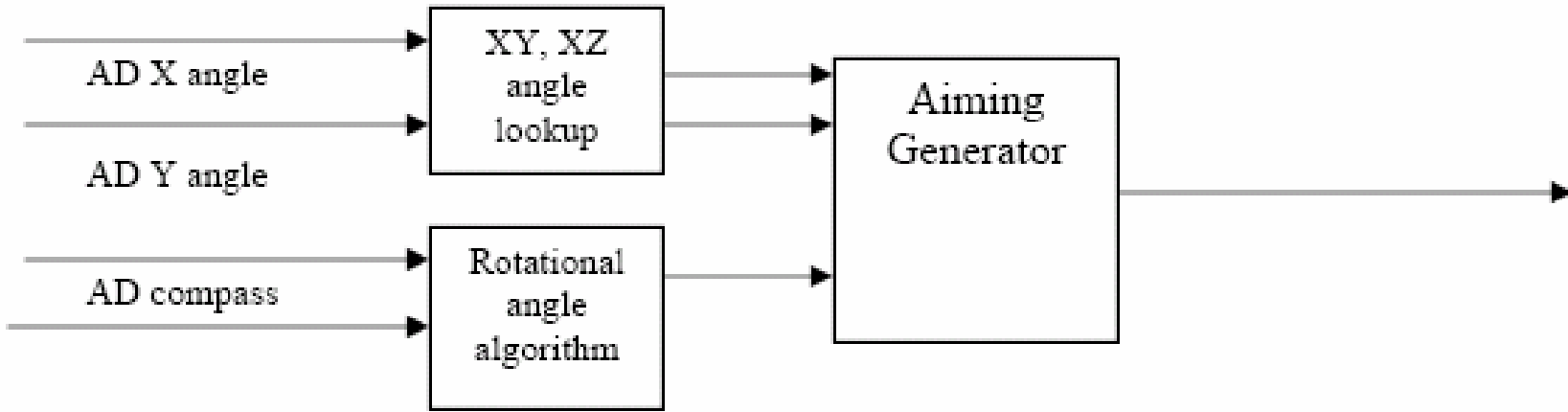- Data Conversion – Andrew and David

Headset

- Includes 2 sensors:
  - Hall-effect compass sensor to measure rotation
  - A 2-axis accelerometer to measure inclination
- Computer control signals will be generated to replace photosensors in a ball mouse, as well as PS/2
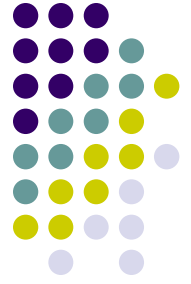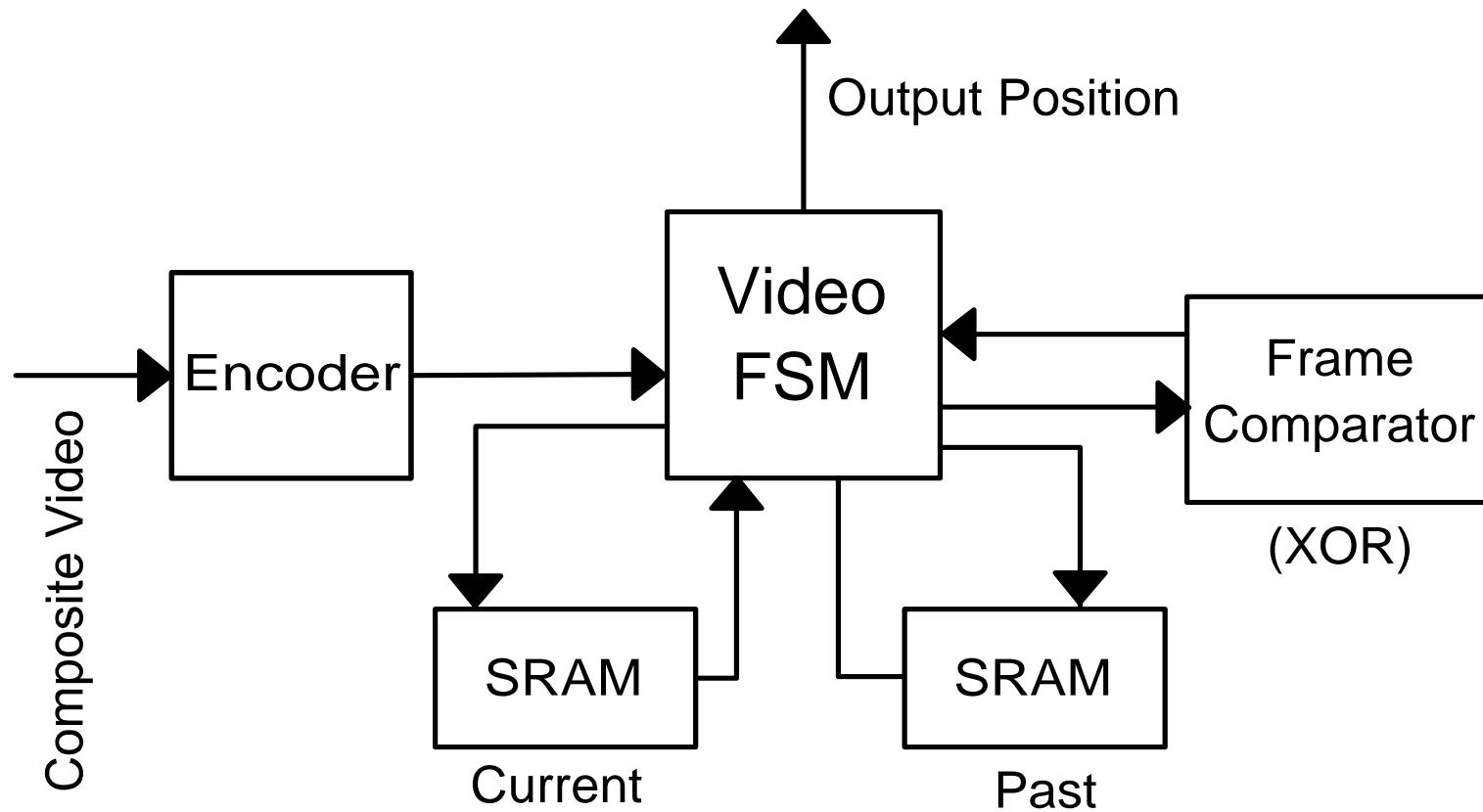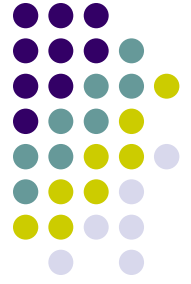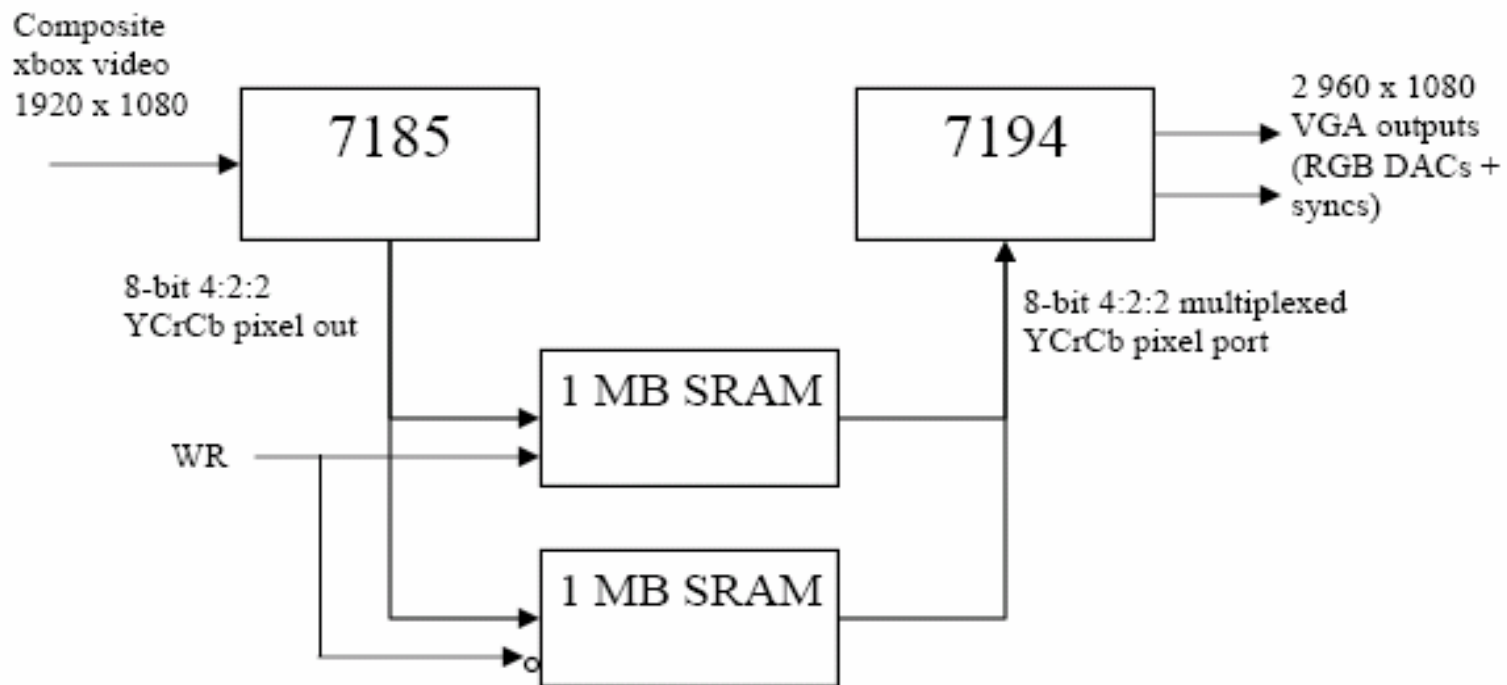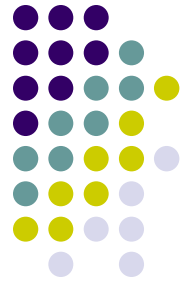
Headset Block Diagram
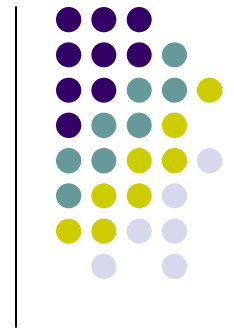
Video Interface

- Will consist of a camera with a top-view of the player's position.

- Will use edge detection to determine the player's direction/position.

- Will map the analyzed information into the correct format for the Xbox/PC.

Video Block Diagram

Output Position

Composite Video → Encoder → Video FSM → Frame Comparator (XOR)

Video FSM → SRAM (Current) → Video FSM

Video FSM → SRAM (Past)

Frame Comparator → Video FSM

VGA Splitter Diagram

Timeline

- April 25 – Working simulations of all modules
- May 2 – Functional interface with Xbox/PC
- May 9 – Completed Testing → Fully functional system